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MONTHLY MICROCLIMATIC SUMMARY

JANUARY 1967

ENVIRONMENTAL DATA BASE FOR REGIONAL STUDIES IN THE HUMID TROPICS

USATECOM Project No. 9-4-0013-01

US ARMY
TROPIC TEST CENTER
Fort Clayton, Canal Zone

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ENVIRONMENTAL DATA BASE FOR REGIONAL STUDIES IN THE HUMID TROPICS

MONTHLY MICROCLIMATIC SUMMARY

JANUARY 1967

Prepared by

Michael A. Fradel, Project Officer and Dr. Wilfried H. Portig, Meteorologist USATECOM Project No. 9-4-0013-01

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Conducted by

Tropic Test Center
Fort Clayton, Canal Zone
with contractual services provided by
Weather Engineers of Panama Corp.

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MONTHLY MICROCLIMATIC SUMMARY

Introduction

Monthly microclimatic data summarized in this series of reports were collected by the US Army Tropic Test Center and the Weather Engineers of Panama Corporation under the project, Environmental Data Base for Regional Studies in the Humid Tropics. The project is sponsored by the Advanced Research Projects Agency of the Department of Defense and by the Army Research Office, Office of the Chief of Research and Development. It is an investigation of microclimatic, air chemistry, vegetation, soils, microbiological, and macrofaunal conditions at selected sites in the principal tropical environments of the Panama Canal Zone and the Rio Hato Military Reservation. The objective of the project is to assemble quantitative environmental data for RDT&E purposes.

Sites. Data summarized in this report were collected at the Albrook Forest and Chiva Chiva sites. Figure 1 shows the site locations within the Isthmus of Panama. Geographic coordinates are shown below:

Albrook Forest 09° 01'N, 79° 33'W Chiva Chiva 09° 01'N, 79° 35'W

The Chiva Chiva open site and the Albrook Forest site are paired for comparative study of environmental conditions in a tropical semideciduous forest and in a large clearing. Both are located in a region where the annual precipitation is approximately 80 inches and there is a pronounced dry season. The other satellite sites were located primarily for soil studies purposes. Albrook and Fort Kobbe have climatic regimes similar to the principal sites.

The Albrook and Chiva Chiva main sites are approximately four kilometers apart. Each has a 46 meter walk-up tower and an air-conditioned building to house the recording equipment and observers. Both sites are approximately 30 meters above sea level. The top of the forest canopy at the Albrook site is about 26.5 meters above the ground.

Instrumentation. A wide range of climatic elements are measured at the Albrook and Chiva Chiva sites. Types of observations and frequencies are shown on Figure 2. The towers at the Albrook and Chiva Chiva sites are similarly oriented. Sensing equipment is mounted at several levels on the towers to provide measurements through the vertical profile. Additional instruments are emplaced in the immediate vicinity on or near the ground. All instrument exposures are duplicated at each site. Figures 3, 4, and 5 show the instrument array at these sites.

Data Reduction and Storage. All data, as applicable, are recorded at or reduced to each full hour and transposed to punch cards. These punch cards, together with all raw data, are stored in the Tropic Test Center Technical Library Annex.

The relative humidity data contained in this report required some adjustment due to the difficult problems in maintaining hair hygrometers in the humid tropics. The hygrometers show saturation at a time when the psychrometer shows a relacive humidity well bel 100%. For this reason the hourly measurements made by means of a hair hygrometer have been modified on the basis of simultaneous psychrometer readings of other levels. Details will be given in the fourth Semiannual Report. It can be assumed that the means of relative humidity presented in this volume are very close to the true means.

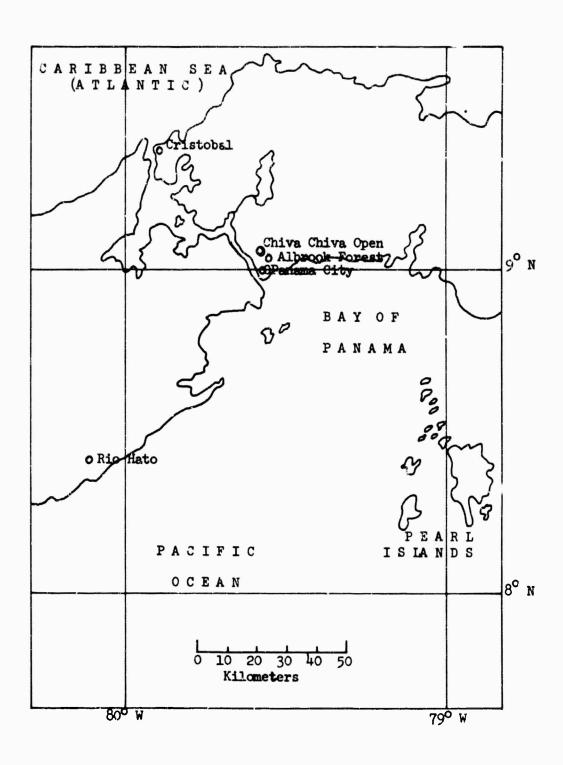


FIGURE 1. LOCATION MAP, ISTHMUS OF PANAMA

FIGURE 2. FREQUENCY OF OBSERVATIONS

Height (meters)

16.0 Frequency	<pre>1 Hourly*/Continuously - Hourly*/Continuous y - Once Daily</pre>	- Hourly (0600-1900 EST)	1 Hourly*/Continuously	- Continuously	2 Once Daily	<pre>2 Continuously - 4 Times Daily - 4 Times Daily</pre>	<pre>1 Continuously 1 Hourly**/Continuously</pre>	Observations made with sling psychrometer when recorders are inoperative.
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86.5	ત ા		н	1,	8	1 1 1	ਜਜ	ations ers ar
Src 0.5 1.0 2.0 4.0 8.0 13.5 26.5 28.5 46.0	d 1 1	1	н	•	N	1 1 1	3*	Observa record
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2.0	طط 1	•	H			110	*	
0-1	rd 1 1	н	н	ď		H (1)	1 1	
0.5	H H 8	•	-		Q nco		1 1	hiva
Sfc	Lim	•	•	•	1	1 1 1		iva c
# Element	Lemostavure: Dry Bulb Wet Bulb Grass Minimum	WBGI Index	Relative Humidity	Barometric Pressure	Evaporation	Precipitation: Recording Gage Mamual Gage Stem Flow	Wind: Direction Speed	 Albrook and Chiva Chiva Albrook only Chiva Chiva only

Instrument descriptions are contained in the Environmental Data Base semiannual reports.

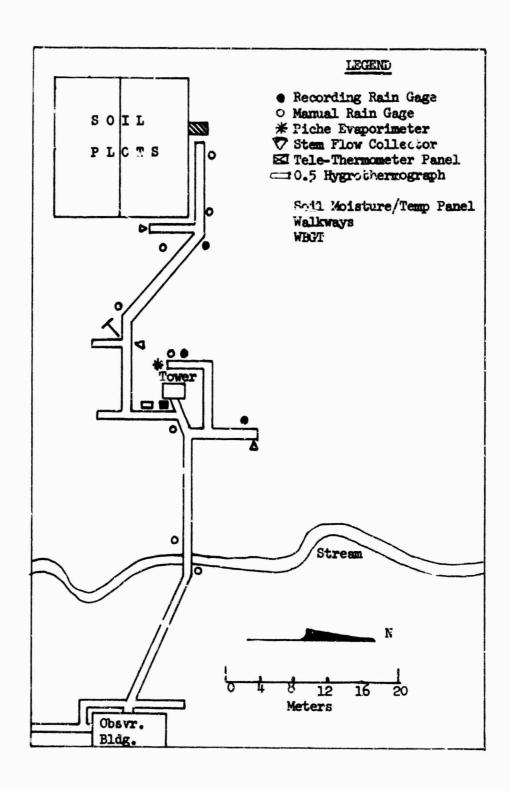


FIGURE 3. ALBROOK FOREST SITE, GENERALIZED PLOT

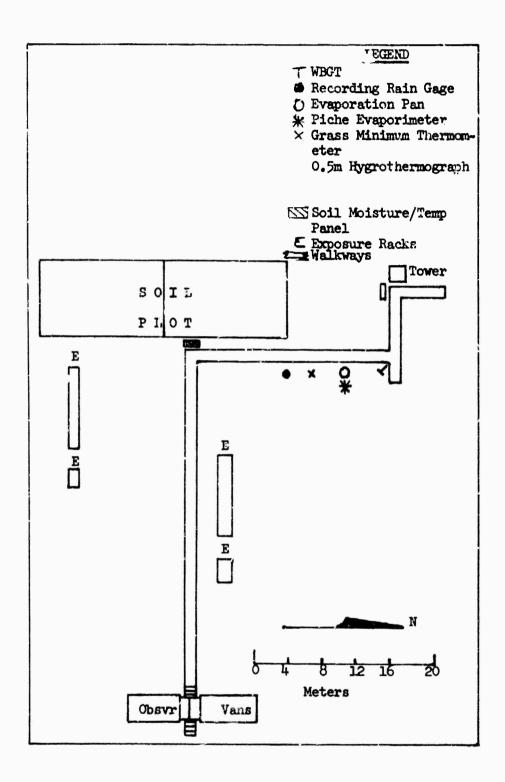


FIGURE 4. CHIVA CHIVA OPEN, GENERALIZED PLOT

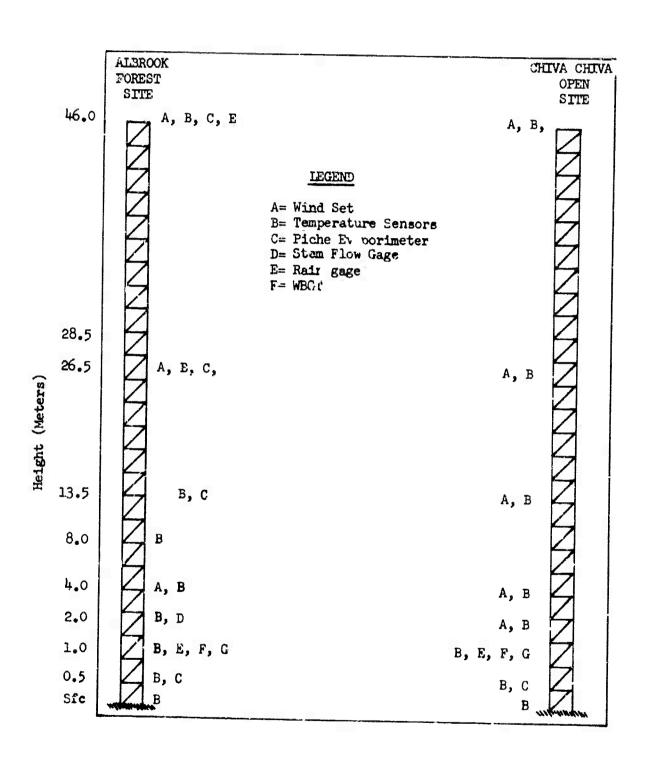


FIGURE 5. INSTRUMENT LOCATION ON TOWERS

SUMMARY OF METEGROLOGICAL OBSERVATIONS

HOURLY DATA

JANUARY 1967

	l V	7		-	24	6	œ	7	0		\neg
<u></u>	Max	89.		1.68	88.	87.	87.	./0	91.	86.7	
Monthly Summary	Min. Mean Max.	78.7		69.1 78.8	78.0	77.3	69.0 77.0 87.8	69.0 76.9 07.7	69.2 77.1 91.0	70.0 77.0	
elly S	Min.	71.7		69.1	69.3	69.1	0.69	69.0	69.2	70.0	
Mon	Je oN ocs	744 71.7 78.7 89.2		744	744 69.3 78.0 88.2	743 69.1 77.3 87.9	744	744	744	742	
		6.4		4.6	4.2	3.5	3.1	3.1	3.4	3.5	_
	23	5.0 7		4.9	4.5	3.8 7	3.4	3.3	3.8	3.9 7	
	09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	86.6 82.7 84.0 84.9 85.6 85.3 85.0 83.7 82.3 90.1 77.8 76.7 76.0 75.5 75.3 74.9		80.8 83.3 84.8 55.6 86.1 86.2 86.0 84.7 83.6 81.0 77.9 76.6 75.7 75.3 74.9 74.6	78.5 81.2 83.2 84.5 85.0 85.3 84.6 83.5 82.5 80.1 77.8 76.5 75.6 74.9 74.5 74.2	78.6 81.2 82.9 83.9 84.6 84.5 83.8 82.9 81.5 78.9 76.5 75.5 74.7 74.3 73.8 73.5	78.6 81.1 82.7 83.6 84.6 84.3 84.0 82.8 81.0 78.1 76.2 75.0 74.2 73.9 73.4 73.1	78.2 80.5 82.3 83.3 84.3 84.1 84.0 82.7 80.8 78.1 76.2 74.9 74.1 73.3 73.3 73.1	82.4 83.6 84.5 84.9 83.9 82.8 81.1 78.4 76.2 75.5 74.7 74.1 73.8 73.4	77.3 79.7 81.6 83.0 83.7 63.8 83.8 82.8 81.3 79.0 76.9 75.7 74.9 74.3 73.9 73.5	
	21	6.0 7		5.7 7	5,6 7	4.7 7	4.2 7	4.1 7	4.7	4.9	-
	20	5.7 7.8		2.6 7	5.5 7	5.5 7.	5.0 7	1.9 7	5.5 7	5.7 7.	-
	6	.8		.9 76	.8 76	.5 75	.2 7	.2 7	2 7	.9 7	
	- 8	.1 77		.0 77	.1 77	9 76	.1 76	.1 76	.4 76	.0 76	
	7	3 90	96	9.	.5 80	.5 78	.0 78	.8 78	.1 78	.3 79	
lour	- 1	7 82	ds tin	7 83	5 82	9 81	8 81	2 80	8 81	8 81	11 1 A. A.
e by F	Ĭ	83	9 at 11	0 84.	83.	8 82.	0 82.	0 82.	9 82.	8 82.	
ratur	15	85.	rature	96	4	83.	84.	84.	83.	83.	
Tempe	14	85.3	tempe	86.2	85.3	84.5	84.3	84.1	84.9	83.8	
of Aur (oF)	13	85.6	or air	86.1	. se	84.6	84.6	84.3	84.5	83.7	
eans	12	84.9	nted f	85.6	84.5	83.9	83.6	83.3	83.6	83.0	
Monthly Means of Air Temperature by Hour (o F)	Ξ	84.0	el was not instrumented for air temperature at this time	84.8	83.2	82.9	82.7	82.3	82.4	81.6	
Mon	10	82.7	not in	83.3	81.2	81.2	81.1	80.5	80.7	79.7	
	60	90.6	Was	80.8	78.5	78.6	78.6	78.2	78.2	77.3	
	0.8	76.8	This leve	76.3	74.9	74.8	74.7	74.5	74.5	74.0	
	07	74.7	Thi	73.8	72.9	72.4	72.1	72.0	72.2	72.3	
-	90	74.2		73.5	73.0	72.5	72.6	72.0	72.1	72.4	
	0.5	74.2		73.6	73.3	72.6	72.3	72.2	72.4	72.6	
	0.4	74.4		73.9	73.4	72.6	72.2	72.2	72.5	72.7	1017104
	03	74.5		74.0	73.6	73.1	72.5	72.4	72.8	73.0	
	-	74.7		74.3	73.9	73.2	72.8	72.7	73.0	73.2	
	01 02	74.9	ALV DISTRIBUTE	74.5	74.1	73.5	73.1	73.0	73.2	73.5	
пе	Level	46.0 m 74.9 74.7 74.5 74.4 74.2 74.2 74.7 76.8	28.5 m	26.5 m 74.5 74.3 74.6 73.9 73.6 73.5 73.8 76.3	3.5 m 74.1 73.9 73.6 73.4 73.3 73.0 72.9 74.5	8.0 m 73.5 73.2 73.1 72.6 72.6 72.5 72.4 74.	4.0 m 73.1 72.8 72.5 72.2 72.3 72.6 72.1 74.	2.0 m 73.0 72.7 72.4 72.2 72.2 72.0 72.0 74.5	1.0 m 73.2 73.0 72.8 72.5 72.4 72.1 72.2 74.5	0.5m 73.5 73.2 73.0 72.7 72.6 72.4 72.3 74.0	
Exposure	Site	-7	21				ok (F	-√1d L^			
- 34	S	J									

743 72.3 78.5 86.7		744 71.4 78,7 86.5	744 70.2 78.7 87.6		69, 5, 78, 8, 89, 5	744 68.8 79.0 90.4	744 88,5 79.2 93.0	79.6 94.9
78.5		78,7	78.7		78.8	79.0	79.2	79.6
72.3		71.4	70.2		69, 5	68.8	58,5	68.8
		744			744			743
82.1 80.2 77.9 76.9 76.2 75.9 75.5 75.3		84.5 84.9 85.0 84.6 83.9 82.7 80.6 78.3 77.3 76.4 76.0 75.6 75.4	84.0 82.7 80.6 78.2 77.1 76.3 75.9 75.5 75.2		74.6	83.6 79.7 77.2 76.0 75.2 74.8 74.4 74.1	82.7 85.6 87.0 88.6 88.8 88.6 87.4 85.5 83.5 79.6 76.9 76.5 75.5 74.9 74.4 74.1	73.7
75.5		75.6	75.5		74.8	74.4	74.4	74.1
75.9		76.0	75.9		75.0	74.8	74.9	74.5
76.2		76.4	76.3		75.4	75.2	75.5	75.0
76.9		77.3	77.1		76.2	0.92	76.5	75.8
77.9		78.3	78.2		86.3 86.7 86.6 85.9 84.7 82.9 79.7 77.3 76.2 75.4 75.0 74.8 74.6	77.2	6.97	86.5 84.2 79.5 77.0 75.8 75.0 74.5 74.1 73.7
80.2		90.6	90.6		7.67	7.67	9.6	79.5
82.1	time	82.7	82.7	time	82.9	83.6	83.5	84.2
83.3	evel was not instrumented for air temperature at this	83.9	84.0	evel was not instrumented for air temperature at this time	84.7	86.7 85.4	85.5	86.5
84.2	ature	84.6	84.9	ature	85.9	86.7	87.4	88.5
84.0 64.5, 84.5 84.2	emper	85.0	84.7 85.2 85.3 84.9	emper	96.6	86.3 87.5 87.8 87.7	88.6	90.0 90.1
64.5	or atr	84.9	85.2	or air	86.7	87.8	88.8	90.0
84.0	nted f	84.5	84.7	nted f	86.3	87.5	88.6	88.8 90.3
83.0	strume	79.6 81.8 83.4	82.2 83.7	strume	84.1 85.2	86.3	87.0	88.8
81.4	not in	81.8	82.2	not in	84.1	84.8	85.6	87.4
79.3	I was	79.6	80.1	l was	81.3	82.0	82.7	84.6
76.2		76.3	76.4	_	78.4	78.8	79.2	80.0
74.9	This	74.4	74.2	The	73.9	73.6	73.5	73.2
74.6		74.3	74.1		73.2	72.5	72.3	72.4
74.7		74.5	74.3		73.7	73.2	73.0	72.8
74.8		74.7	74.5		74.0	73.7	73.3	73.1
74.9		74.8	74.6		74.1	73.7	73.5	73.1
75.0		74.9	74.7		74.0	73.6	73.5	73.3
75.1		75.1	3.5 m 74.9 74.7 74.6 74.5 74.3 74.1 74.2		3.0 m 74.3 74.0 74.1 74.0 73.7 73.2 73.9 78.	2.0 m 73.8 73.6 73.7 73.7 73.2 72.5 73.6 78.8	1.0 m 72.8 73.5 73.5 73.3 73.0 72.3 73.5 79.2	0.5 m 73.4 73.3 73.1 73.1 72.8 72.4 73.2
46.0 m 75.1 75.0 74.9 74.8 74.7 74.6 74.9	28.5 m	26.5 m 75.1 74.9 74.8 74.7 74.5 74.3 74.4 76	13.5 m	8.0 m	4.0 m	2.0m	1.0 m	0.5 m
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SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOUR'Y DATA JANUARY 1967

nary*											
Monthly Summary*						_					_
Mont											
	24	 ee		હ	4.7	4.7	5,5	5.7	4.9	5.6	
	23	 		4.2	4.9	5.2	2.6	5,3	5.1	5.4	
	22	3.3		3.0	8.8	6.9	5.5	5.2	4.9	4. ∞	
	21	3.6			4.3	5,1	5.1	5.0	3.	3.8	
	20	2.9		4.2	4.5	6.	7.	. 5.	4. ε.	3.7	
	19	6.2		6.2	5,1	5.1	4.9	9.	4.2	4.8	
	18	7.4		10.0	7.9	10.2	6.5	5.7	6.2	5.8	
i,	17	8.4	time	10.8	8.3	8.3	8.9	9.9	6.5	7.2	
by Ho	16	8.1 10.0	t this	10.9	9.0	8.9	8.6	8.7	9.0	7.8	
rature	15	8.1	sture &	8.6	9.8	9.1	7.9	7.5	9.3	9.9	
Тетре	14	7.1	emper	7.5	7.2	7.9	7,5	7.2	16.2	9.9	
of Air	13 14	7.6	r air t		7.8	7.0	7.8	8.3	9.5	7.2	
anges	11 12	6.5	nted fo	7.1	8.8	10.8	9.3	6.3	9.4	7.0	
Monthly Ranges of Air Temperature by Hour (o F)	=	4.9	was not instrumented for air temperature at this time	5,4	6.2	7.4	6.7	7.0	7.5	7.4	
Mon	10	9.4	not ins	5.5	5.2	9.9	5.5	5.5	6.1	4.0	
	60	6.9	Was	6.9	5.0	5.3	5.5	5.2	5,0	3,8	
	9,	5.9	This level	7.4	6.3	5.5	. i	8.8	5.0	5.4	
	07	3.6	Thi	6.3	9.5	6.1	5,1	5.4	6.4	5,3	
	90	5.4		8.0	6.9	5.6	5.4	5.5	ε.	5.0	
	90	5.0		7.5	6.4	4.4	5,3	5.8	8.	4.2	
	04	3.7		7.0	8.8	5.6	5.8	5.2	4.5	4.2	
	03	3.0		5.1	4.9	5.6	5.1	5.0	4.1	5.0	
	0.2	3.3		3.9	6.0	9.6	5.0	5.5	4.1	5.3	
	01	3.8		3.7	5.6	4.9	5.7	6.5	4.7	6.2	200
ure	Level	46.0 m	28.5 m	26.5 m	13.5 m	8.0 m	4.0 m	2,0 m	1.0 m	0.5 m	
Exposure	Site					15910	K (F	o 1 proc	A		

* No monthly summary was computed for

					_			
				-				
3.7	-	4.1	3.4		6.2	5.6	8.8	9
	ewit a filmino	4.3	3.5		4.9	8.8	4.6	a v
3.3 3.8 3.8		3.9	4.0 3.4 3.2 3.5		4.5 4.7 4.3 4.9	4.9	4.0	2 4 6
3,3		4.6	3.4		4.7	5.5	4.6	-
3,3		5.1 3.9	4.0		4.5	4.4	3.8	3 6
4.7	LINE CONTR		6.2		4.2	4.4	6.4	•
8.9	ariable and more	œ.	9.9		6.5	6.3	6.2	,
7.7 7.4	time	8.3	4.6 4.0 1.2 4.5 6.6 5.9 8.1 7.6 7.2	time	9.1 6.5	9.1	9.0 10.0 13.2 10.3 8.9	0
7.7	This level was not instrumented for air temperature at this time	8.2	7.6	was not instrumented for air temperature at this time	10.7	9.1	10.3	2 0 1 2 0 1 2 0 1 0 1 0 1 0 1 0 1 0 1 0
8.3	ature	9,1	9.1	ature	10.9	17.1	13.2	
4.4 6.0 4.9	temper	5.0	5.9	temper	7.0 7.8 8.1 10.9 10.7	8.0	10.0	0
6.0	or air	4.9 5.9	9.9	or air	7.8	£.		4
	inted f		4.5	inted f		7.5	8.3 10.0	
3.7 3.8	Strume	3.8	5 7	strume	5.3	6.3		0
	not in	4.6	4.0	not in	7.6 5.9	6.0	9.2	ē
5.1	al was	0.4	4.6	el was	7.6	7.8	10.6	9
3.8	s leve	5.8	5.4	This leve	9.9	7.2	8.7	ř
3.3	Th	4.7	6.4	Ę	5.0	6.0	6.5	•
3.6		5.0	6.3		8.0	7.4	50	î
4.1		5.1	6.7		6.5	7.6	0.5	1
3.8		5.1	5.4		9.9	6.2	5.7	,
3.4 3.7		3.6	5.0		9.9	6.3	5.5	
		3.4	4.0		5,7	5.7	4.8	1
2.6		φ. φ.	3.5		5.7	2.6	8	
46.0 m	28.5 m	26.5 m	13.5 m	8.0 m	4.0 B	2.0 m	1.0 m	

SUMMARY OF METEOROLOGICAL OBSERVATIONS HOURLY DATA

JANUARY 1967

	×						0	0	60	0
ary	Mean Max.	96		67	97		100	100	86	100
ியாகார		76		77			84	88	8.5	87
Mont	Mar.	46		20	53		50	52	57	26
Mo	No of	740		744	744		744	744	744	730
	24	85		88	6		94	94	93	93
	23	00 70		87	9.1		93	76	92	93
	22	84		98	0.6		16	92	35	92
	21	83		88	83		91	16	16	06
	20	81		82	84		88	68	88	88
<u> </u>	19	77		79	79		84	88	98	86
	18	72		73	74		80	18	81	83
one	17	29	at this time	99	69	s time	74	92	77	7.9
y by H	16	63	at thi	63	29	at this	20	72	72	75
umidit	15	61	midity	6.1	99	mic.	69	69	70	72
live H	14	69	ive hu	09	63	ive hu	99	29	8.9	71
(%)	13	55 55	r relat	53	63	r relat	64	99	6 0	17
o supe	12	0.9	oj pati	69	99	ted fo	29	20	20	74
Monthly Means of Reletive Humidity by Hour (%)	Ξ	6.2	not instrumented for relative humidity	63	69	not instrumented for relative humicy	71	73	;- 4	28
Mont	10	29	ot ins	29	74	oc ins	7.5	78	79	8
	60	72	w w	72	8	Was	93	98	87	16
	0.8	80	s level	83	35	level	93	4	98	98
	0.7	85	This	88	94	This	96	97	96	96
	90	98		96	94		96	96	9.2	98
	0.5	98	tur - y - t	06	93		96	96	3.5	9.8
	04	98		68	33	. 44	96	9.5	9.8	9.6
	03	م		68	93		96	96	7 6	4 6
	02	98		68	9.5		9.8	9.8	7	7 6
	01	85		80	95		£.	9.8	94	9.4
w.e	Leve!	46.0m	8.5 m	6.5 m	3.5 m	8.0 m	E 0.4	2.0 m	1.0 m	0.5 E
Exposure	Site 1	<u> </u>	00 24	(911	_	5103)				
	62									

9.8		97	43		100	66	66	100
77		77	77		7.8	78	78	7.8
4		47	7		8	46	46	45
744		744	744		744	743	742	714
986		87	87		68	9.0	0.6	06
8.5		98	986		68	58	68	06
88	•-	82	88	d words	88	98	38	83
84		84	84		98	98	87	87
81		82	83		83	8 0	85	4
77		77	78		80	80	28	81
7.2	đi.	7.1	72	ć,	73	73	74	75
99	Is time	6.5	99	is time	89	99	65	65
63	y at this	62	62	y at this	9	10	60	62
09	*elative humidity	59	59	umidit	09	59	23	28
53	tive h	28	28	Live h	\$9	57	999	55
\$9	pı .ela	29	80	or rela	59	28	S 6	26
61	nted f	9	59	nted f	ŗ	28	57	26
64	was not instrumented for	63	62	not instrumented for relative humidity	62	62	0.9	29
70	not in	89	89	not in	29	65	99	63
9/		74	74	MBS W	74	72	74	69
83	s ieval	83	83	s level	82	81	83	79
87	This	89	88	This	92	9.5	35	93
388		6	68		9.5	93	93	94
87		88	98		91	16	92	93
88		80	88		16	16	91	92
87		88	87		06	0.6	16	92
87		88	88		16	91	91	9.5
98		87	88		06	-15	8.1	9.2
46.0 m	28.5 m	26.5m	13.5 ш	8.0 m	4.0 H	2.0 m	1.0 m	0,5m
	(ejt:	10) EV	гчэ с	СЫТМ		

SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOURLY DATA

JANUARY 1957

											_
iry*											
Summs											
Monthly Summary*											
C											
	24	13		12	65		12	ø	00	12	
	23	12		11	ð		14	13	7	1.2	
	22	Ξ		12	10		13	13	00	15	_
	21	61		11	1.5		1.5	14	10	12	_
	20	17		16	20		19	13	1.2	œ	
	19	20		26	2.5		24	22	91	12	_
	18	26		2.5	28		26	53	22	26	
lour	17	3.4	it this time	31	40	was not instrumented for relative humidity at this time	37	32	27	34	
y by F	16	35	, it th	40	38	at thu	44	5	37	38	
lumidii	15	3.5	midity	31	42	midity	41	39	37	37	
Monthly Ranges of Relative Humidity by Hour ($\%$)	13	30	was not instrumented for relative humidity	31	32	tive hu	40	37	29	36	
of Rela	13	34	or rela	32	35	r rela	39	39	32	36	
nges	12	32	nted fo	28	38	nted fo	47	46	36	38	
thly Re	Ξ	53	trume	22	30	trume	37	35	31	53	
Mon	10	27	no: In	22	25	not in	28	52	30	2.5	
	60	27		89	24		24	23	22	17	
	0.8	1.8	This level	18	Ξ	This level	13	Ξ	6	00	_
	0.7	1.5	Th	13	. `	Ē	=	10	9	00	
	90	20		16	=		6	6	9	9	_
	0.5	-		17	-		œ	00	9	10	
	04	£ 1		14	00	***	6	00	20	10	
	03	10		on .	10		10	6	00	11	
	02	σ'n		13	12		13	12	ďη	=	
	0.1	54		12	6		1.2	10	7	13	
ıre	Level	46.0 m	28.5 m	26.5 m	13.5 т	8.0 m	4.0 m	2.0m	1.0 a	0,5 m	
Exposure	Site	Albrook (Torest site)									

* No monthly summary was computed for the ranges.

								<u>.</u>
18		1.8	20		19	2.0	16	19
16		17	19		16	19	18	18
91		1.8	81		14	20	4	7
*		1.5	91		œ	1.9	11	12
4.		12	91		19	20	13	91
20		2.2	20		2.3	25	17	22
27		26	25		27	2.5	26	24
31	is time	32	32	s time	3.5	37	33	33
35	at th	35	35	at ih	34	34	36	40
33	midity	34	6.2 44.	raidim:	32	33	34	27
29	ave hu	30	33	ive hu	31	33	33	33
53	r relat	3.5	32	r relat	33	34	38	4 €
27	was not instrumented for relative humidity at this time	26	27	was not instrumented for relative humidity at this time	29	27	32	40
16	trume	20	20	trume	19	21	22	25
17	not ins	18	17	not ins	8	23	2.2	22
18		6	19		28	53	28	33
12	This level	13	7	This level	20	2	23	23
20	T.	4	16	E .	17	3	13	12
20		13	17		1.5	1.2	1.2	7
4	-	7	14		17	1.4	14	ε1
91		1.4	11		91	en 	7	11
12		10	13		13	1.2	13	13
9	-	16	£.	-	1.5	11	11	77
91		17	1 6		1.9	.9	67	Ξ
46.0 m	28.5m	26.5 m	13.5 m	8.0 m	# 0 #	2.0 m	m 0.1	0.5

SUMMARY OF METEORCILOGICAL OBSERVATIONS HOURLY DATA

JANUARY 1967

			ν.	9	E2	50 US CO #1
<u> </u>	Min. Mean Max.	744 68.0 73.2 80.0	79.	80.6	.620 .718 .820	0.01 0.51 0.38 0.01 0.33 0.26 0.01 0.37 0.30 0.01 0.41 0.33
ummäi	Mear	73.2	73.4	73.8	.718	0.51 0.33 0.37 0.41
Monthly Summary	Min.	68.0	68.0	68.8 73.8	079.	0.01
Mon	No of obt.	744	744	730	744	∨ा च च च
		71.9	71.9	72.1	. 743	0.00
	23 24	72.0	72.1	72.3	.747	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0
	22	72.1	72.2	72.5	746	0.00
	20 21 22	72.3	72.3	72.7	735	0.00
	20	12.4	2.5	3.1	715	0.00
	61	2.8	3.0	3.7	700	0.00
		71.4 73.3 74.8 75.0 75.3 75.0 74.9 75.2 75.6 75.1 74.6 73.5 72.8 72.4 72.3 72.1 72.0 71.9	71.4 73.3 75.0 75.4 75.5 75.4 75.3 75.4 75.9 75.5 75.0 73.9 73.0 72.5 72.3 72.2 72.1 71.9 744 68.0 73.4 79.5	5 71.4 73.0 75.2 75.9 76.2 76.3 76.2 76.4 76.2 75.8 74.9 73.7 73.1 72.7 72.5 72.3 72.1	.711 .733 .755 .770 .773 .762 .739 .712 .688 .666 .662 .667 .678 .700 .715 .735 .746 .747 .743	0.00 0.00 0.00 0.00 0.03 0.20 0.00 0.00
	16 17 18	4.6	15.0	.8.2	199	0.00 0.00 0.02 0.00 0.02 0.00 0.03 0.00
y Hou	16	5.1	5.5	9	299	0.20
ents b	15	30.0	5.9	, 4 .	999	0.03 0.26 0.00 0.26 0.00 0.30 0.00 0.31
Clem		5.2.7	5.4 7	6.2 7	688	8888
Monthly Meens ² of other Dements by Hour	13 14	4.9 7	5.3 7	6.2 7	712	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
ns ² o	12	2.0 7	5.4 7	6.37	739 .	0.00
y Mee	==	5.3 7.	5.5 7	5.2 7	762 .	0.00 0.
Acath	01	. 0 7:	7.4	92 6*9	73	0.00
-	09 1	8 28	.0 7	. 2	7.0	0.00 0.00 0.07 0.00 0.00 0.00 0.00 0.04 0.01 0.00 0.00 0.00 0.04 0.01 0.00 0.00 0.00 0.06 0.01 0.00
	0 8 0	.3 74	3 75	-0-	55 .7	0.00
		- 4	4 73	.4 73	33 .7	000000000000000000000000000000000000000
	20 9	ω.	3 71	5 71	11 .7	0000
	90 9	5 71.	5 71	9 21		0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
	05	5 71.	5 71.	7 71.	. 700	0.00 0.
	5	6 71.	6 71.	8 71.	0.69	00000
	03	8 71.	7 71.	0 71.	4.70	
	0.2	71.9' 71.8 71.6 71.5 71.5	72.0 71.7 71.6 71.5 71.5	72.2 72.0 71.8 71.7 71.6	.728 .714 .700 .695	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
	0		_		.72	0.00
sure	Code	WB (4.0 m)	w8 [2.0 m]	W8 (0.5 m)	BP	1 0 0 T
Exposure	Site		(91	orest si	-	
·		<i></i>				

						,
	79.9	78.5	79.3	.915	0.09	
	73.4	73.4	77 B	. 807	0,11	
,	2.63	68.2	68.7	.705	2 0.02 0.11 0.09	
	744	743	744	744 .705 .807	8	
	2.3	о. С	1.8		00.0	
washing of the	2.4 7	2.0 7	2.0 7	834	00.	
	2.4 7	2.2 7	2.2 7	835	0 00.	
enan. —He	5 7	.3	2.3	325	00	
-	.6	- 5-	.5 72	. 104	00	
	.8 72	.7 72	.7 72	88	00	
	3 72	3 72	5 72	7. 89	0.00	
	5 73.	5 73.	1 73.	7 .76	0.0	
	74.	7.	8 75.	3 - 75	2 0.0	
	74.:	75.0	75.	.75	0.0	-
	75.0	75.3	76.4	.756	0.00	
	75.1	75.5	76.8	.777	0.00	
	75.2	75.6	76.9	808	0.00	
	75.0	35.6	77.2	.831	0.00	
-	75.1	75.7	77.0	.854	0.00	
	75.1	75.5	76.8	.863	0.00	-
	74.8	75.1	76.3	.860	60 0	
andro-	7.2		9.	841	00.00	
	2.1	6.1.	8.1	818	00.1	
	1.5	1.1	-:-	800	09.	
	1.7	1.5 7	1.3	786	000	
	2.0 7	.8 7	1.5 7	782	0 00	
	.0 7	.7	4.	28	00 0	~~~
	.0 72	.7 71	.6 71	96	00 00	
	W8 72.2 72.6 72.0 72.0 72.7 71.5 72.1 74.2 74.8 75.1 75.0 75.2 75.1 75.0 74.5 74.5 73.3 72.8 72.6 72.5 72.4 72.4 72.3 744 69.2 73.4 79.	W8 71.9 71.7 71.7 71.8 71.5 71.1 71.9 74.4 75.1 75.5 75.7 75.6 75.6 75.5 75.3 75.0 74.5 73.3 72.7 72.5 72.3 72.2 72.0 71.9 743 68.2 73.4 78.5 .0.m3	71.7 71.6 71.6 71.5 71.3 71.1 71.8 74.9 76.3 76.8 77.0 77.2 76.9 76.4 75.8 75.1 73.5 72.7 72.5 72.3 72.2 72.0 71.8 744 68.7 77 8 79.3	813 .739 .785 .786 .800 .818 .841 .860 .863 .854 .831 .805 .777 .756 .753 .757 .768 .788 .804 .825 .835 .834 .829	0.00 0.00	
	72)	71	71	70	0	
	W8 (4.0m)	₩8 (2.0m)	:7B (0.5 m)	95	54	
	(en site	qO) svi	9 CP	СРТЛ	

WB - Wat bulb temperature (Of) BP - Barometric pressure (in of Hg minus 29.0)

PS - Precipitation at 1.0 m. in open area (in.) P1 - Precipitation at 46.0 m. above canopy (in.) P2 - Precipitation under full canopy (in.)

P3 - Precipitation under drip canopy (in.)
P4 - Precipitation under open canopy (in.)

Precipitation totals are substituted for the mean in the monthly summary. $^2\,\mathrm{Monthly}$ means of precipitation are computed for precipitation days.

SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOURLY DATA

-	-									Moi	u krus	5	10 10	ner Li	Monthly Ranges" of other Elements by Hour	H A	ino								Monthly Summary*
Site Code	0.1	05	03	04	0.5	90	07	9.8	60	10	11	12	13	13 14 15		91	17	-8	19	20	2.1	22	2.3	2,1	
WB (4.0 m)	т) 4.5	. a.	4.0	 o	5.0	5.5	o. ₹	4.9 3.3 4.0	4.0	3.8 4.9	4.9	5.B	5.7	6.2	6.2 7.2	8.2		7.1 5.7 4.9	4.9	4.2	- 1			4.5	
WF (2.0 m)	. î	4	4	£. 5.	5.0	นกั เกร	5.1	3.5		3.3 4.0 5.3 6.0 5.2	6.	6.0	5,2	5.7	6.1	7.8	6.0	5.1	4.	4.2	4.1	4.2 4.1 4.1 4.4	4.	2.2	
0.5 %	m. 4.4	7	4.9	5.1	N,	5.5	χς γ	4 . 9	3.0	3.7	4.		5.5		5.7 6.2	6.2	0.9	6.2 6.0 6.0	4. 80	4.8 4.5 4.3	 	4.2	3.8	4.	
Д. П	060.	.095	. 095	.100		.105	.110	110 .100 .095 .090	\$60.	060.	1115	.105	.105	120 . 085 . 051.	.085	060.	100	2	-	211	9		Ş		
P1 P3 P4	0.00	0.00	0.00	0.00 0.00 0.00 0.00 0,00 0.00 0.00 0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.00	0.37 0.00 0.00 0.00 0.00 0.00	0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00	0.00	0.00 0.00		0.00	0.00	

* No monthly summary was computed for

-					
-					
-					
-	4.	5.5	٤,	1	00
	Ţ.		=	L	0 00
	3.7 4.4 3.1 2.8 4.2 4.2 5.1 5.2 5.9 8.0 7.4 8.2 5.2 5.0 5.1 4.2 3.8 4.1 4.4	5.1 4.5 4.1 4.5	3.6 3.5 3.0 3.3 3.8 3.4 3.2 3.4 3.0 5.5 4.6 4.0 3.9 3.9 3.5 3.4 4.1 4.3	. 105 . 100 . 095 . 010 . 095 . 090 . 091 . 001	0.46 0.00 0.00 0.00 0.00 0.00 0.00 0.00
-	2.	25	بن س	u	00 0.
-	-i	4	න න	2	0 0,0
	0 2	· 6	e e	-	0.0
	2.	ψ) W	 	4	0.0
	5.		4.	. 12	0.0
_	80	.9	4.6		0.00
	7.4	4,	(-)	.095	0.00
	8.0	0 * 9	3.0	060.	0.00
	5.0	6.3	್ಕ್	.100	0.00
	5.2	5,0	3,	.095	0.00
	5.1	₩) **	a, 4	100	00 0
	4.2		ec.	100	00.4
	4.2	5.0 4.2 2.8 2.7 4.5 4.5 5.0 6.3 6.0 4.8 6.5 5.5 5.0	(n)	. 360	00.
	2.8	2.3	3.0	100	0 00
	3.1	2.8	. s.	001	0 00
	4	2.5	3.6	105	00 00
	3.7	0	9	1.0	00 0.
			- 9	10:01	00 0.
	0.	δ. 	7	. 08	0 00
	0	4.0 3.5 5.5	44 La	.0	0.0
	7	42	۵. 4.	0.08	0 0
	3,7 3,7 4,0 3,0 4,2	3.8	3,5 3.9 4.4 3.7 4.6	011. 011. 090, 080, 090, 011.	0.00 0.00 0.00 0.00 0.00 0.00
		4,2		=	0.0
	WB 4.0 m)	₩8 2.0 mg)	WB 0.5m)	B.P	573 6kg

WB - Wat bulb temperature (OF)
BP - Barometric pressure (in, of Hg minus 29.0)

PS - Precipitation at 1,0 m. In open area (in.) P1 - Precipitation at 46.0 m. above canopy (in.) P2 - Precipitation under full canopy (in.)

P3 - Precipitation under drip canopy (in.) P4 - Precipitation under open canopy (in.)

 $^2{\rm Monthly}$ ranges of precipitation are computed for pracipitation days.

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SUMMARY OF METEOROLOGICAL OBSERVATIONS HOURLY DATA

JANUARY 1967

46.0 m	28.5 т	26.5m	13.5 m	8.0 m	4.0 m	2.0 m	1.0 m	0.5 m
7		9	e	,	m	H		
7		9	m		6	2	The second	
00		7	m		4	2		
7		9	m		4	2	•	
7		2	21		en	1		
7		ďΩ	2		က	,4		
7		Ν	2		6	-	-	
7	This	Q	4	This 1	Ŋ	3	Ints 1	This level was not instrumented for wind speed at this time
ø.	evel w	00	7	evel w	7	ıo	evel w	evel w
11	as not	11	=	as not	თ	7	33 not	as noc
12	This level was not instrumented for wind speed at this time	11	13	This level was not instrumented for wind speed at this time	10	80	Inis level was not instrumented for wind speed at this time	instru
13	mente	13	14	mente	10	6	menter	mente
13	d for w	13	1.4	d for w	10	6	d for w	- L
14	ds but	14	7	ds per	1.2	10	ds pui	ind &p
13	eed at	13	14	eed at	10	6	eed at	14
12	this	12	12	this t	10	œ	this to	this
=======================================	ime	11	10	ime	80	7	ne n	g E
10		6	œ		7	4		
®		œ	2		Ŋ	<u>س</u>		
G.		7	LO.		ν,	9		
60		7	4		4	2	-	
		9	4		4	7		
 00		9 9	4	· Company of the last	4	2 2		20 1990
7 741		6 725	4 744		722	744		
0		2	4		2 0	0		
on .		00	7		9	4		

SUMMARY OF METEOROLOGICAL OBSERVATIONS HOURLY DATA

JANUARY 1967

ımary*												
Monthly Summary*												
Mont												,
	24		-1		7			4		-x+t - '*		
	23	,	=		מי			9				
	22	c	T:		40			_				
	21		0.7		ις.			2				
	20	9	2		4			~				
	19		20		4			~				
	80	,	ת		6	_		4				
n.	17		≓	time	01	time :	time	64	time	s time	s time	
by Ho	16		9	at this	7	øt this	at this	?>	at this	at this	at this	
Speed	1.5	;	- 12	peeds	S	apeed	speed	™	speed	speed	speed	
Wind //hr.}	14		22	wind	17	wind.	wind	4	wind	wind	wind	-
Monthly Ranges of Wind Speed by Hour (miles/hr.)	13	-	50	ted for	10	ted for	ted for	44.	ted for	ted for	ted for	
ly Ran	12		13	титеп	10	rumen	runen	4	rumen	trumen	trumen	
Month	=		61	This level was not instrumented for wind speed at this time	14	This level was not instrumented for wind speed at this time	s level was not instrumented for wind speed at this time	æ	This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time	
	10	_	91	Was n	80	was n	Was n	¢1	WAST	was r	Wasr	
	60	-	16	level	=	slevel	level	77	s level	s level	s level	
	1 80	-	<u>-</u>	This	r.c	This	This		Tht	Thi	Thi	
	0.7	-	1		9			-		_		-
	90		01	-	vî.	_		n				
	0.5		.3		-1		-					
	0.4	-	10		5			67				
	2 03	-	2 11		رب در		e					
	01 1 02	_	1 12		ıń			<u>س</u>				
- 0	-	-	0 m 11	E S		E	8.0 m	E 0	7.0 m	1.0 m	E 2	-
Exposure	⊢	Tevel 1	46.0 m	28.5 m	26.5 m	13.5m					0.5	_
á		3170			(9119 1	0162	⊒) ¥¤	/Ipro	f		

summary	TO.	
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				22 22 22 435 no	13 13 29 29 14 14 14 14 14 14 14 14 14 14 14 14 14	22 25 25 ument 18 18	19 24 24 14 15 ed for	wind 20 20 wind wind 13 16 wind	\$peed 22 \$peed 11 12 \$peed	15 20 20 13 15 15 15 15 15 15 15	ond speed at this time 15 14 15 12 20 22 20 14 vind speed at this time 13 11 13 12 16 12 15 15 vind speed at this time	12 20 13 13	10 7 7 01					11 13 14 17 10 16 9 9 9 9
- 6 11 6 9 6 9 6 6 6 6 6 6 6 6 6 6 6 6 6	7 7 6 9	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	10 11 12 2 4 9 6 9 8 9 8 9 8 9 9 9 9 9 9 9 9 9 9 9 9	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 9 R	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 9 R	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 4 5 His	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 4 5 His	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 1 1	This 11 12 11 12 11 12 11 12 11 12	This 11 12 11 12 11 12 11 12 11 12	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 9 Refer this 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 17 18 18 18 18 18 18 18 18 18 18 18 18 18	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 9 Reference of This This This This This This This This	This level was not instrumented for wind speed at this time 10 11 12 11 13 14 13 22 19 15 14 15 12 12 7 6 6 12 19 22 29 25 24 20 22 20 14 This level was not instrumented for wind speed at this time 9 6 9 8 11 10 14 18 14 13 11 13 12 6 4 5 8 11 14 14 18 15 16 12 15 15 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 7 6 6 12 19 22 29 25 24 20 22 20 14 20 This level was not instrumented for wind speed at this time 9 6 9 8 11 10 14 18 14 13 11 13 12 12 This level was not instrumented for wind speed at this time 7 7 8 11 14 14 18 15 16 12 15 15 13 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 7 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 This level was not instrumented for wind speed at this time 9 6 9 8 11 14 14 18 15 16 15 15 15 15 17 6 This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 7 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 17 This level was not instrumented for wind speed at this time 9 6 9 8 11 14 14 18 15 16 12 15 15 15 10 6 10 This level was not instrumented for wind speed at this time 7 7 6 8 10 10 14 18 15 16 12 15 15 15 10 6 10	This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time 6 4 5 8 11 14 14 18 15 16 12 15 15 15 16 16 10 6 10 6 This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time 6 4 5 8 11 14 14 18 15 16 12 15 15 15 15 17 6 8 9 9 This level was not instrumented for wind speed at this time 7 6 6 9 8 11 14 14 18 15 16 12 15 15 15 17 6 8 9 9 This level was not instrumented for wind speed at this time
	7 7 6 9	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	10 11 12 7 6 6 9 6 9	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 9 R	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 9 R	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 4 5 His	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 4 5 His	This 11 12 11 12 11 12 11 12 11 12	This 11 12 11 12 11 12 11 12 11 12	This 11 12 11 12 11 12 11 12 11 12	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 4 5 His	This 11 12 11 7 6 6 12 This 9 6 9 8 6 9 8 6 4 5 His	This level was not instrumented for wind speed at this time 10 11 12 11 13 14 13 22 19 15 14 15 12 7 6 6 12 19 22 29 25 24 20 22 20 14 This level was not instrumented for wind speed at this time 9 6 9 8 11 10 14 18 14 13 11 13 12 6 4 5 8 11 14 14 18 15 16 12 15 15 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 10 11 12 11 13 14 13 22 19 15 14 15 12 12 7 6 6 12 19 22 29 25 24 20 22 20 14 20 This level was not instrumented for wind speed at this time 9 6 9 8 11 10 14 18 14 13 11 13 12 12 6 4 5 8 11 14 14 18 15 16 12 15 15 13 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 7 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 This level was not instrumented for wind speed at this time 9 6 9 8 11 10 14 18 14 13 11 13 12 7 6 6 4 5 8 11 14 14 18 15 16 12 15 15 13 10 6	This level was not instrumented for wind speed at this time 7 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 17 This level was not instrumented for wind speed at this time 9 6 9 8 11 16 14 18 15 16 15 15 15 1 7 6 8 This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 7 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 17 17 This level was not instrumented for wind speed at this time 9 6 9 8 11 14 18 15 16 12 15 15 15 15 10 6 10 6 This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time	This level was not Instrumented for wind speed at this time 7 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 17 10 13 This level was not instrumented for wind speed at this time 9 6 9 8 11 10 14 18 14 13 11 13 12 7 6 8 9 9 This level was not instrumented for wind speed at this time 6 4 5 8 11 14 14 18 15 16 12 15 15 13 10 6 10 6 7
		11 9 7	11 12 6 6 6 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	This 11 12 11 6 6 12 This 6 9 8 4 5 8 This This This	This 11 12 11 6 6 12 This 6 9 8 4 5 8 This This This	This 11 12 11 6 6 12 This 6 9 8 4 5 8 This This	This 11 12 11 6 6 12 This 6 9 8 4 5 8 4 This This	This 11 12 11 6 6 12 This 6 9 8 6 9 8 4 5 8 This This	This 11 12 11 6 6 12 This 6 9 8 6 9 8 4 5 8 This This	This 11 12 11 6 6 12 This 6 9 8 6 9 8 4 5 8 This This	This 11 12 11 6 6 12 This 6 9 8 4 5 8 4 This This	This 11 12 11 6 6 12 This 6 9 8 4 5 8 4 This This	This level was not instrumented for wind speed at this time 11 12 11 13 14 13 22 19 15 14 15 12 6 6 12 19 22 29 25 24 20 22 20 14 This level was not instrumented for wind speed at this time 6 9 8 11 16 14 18 14 13 11 13 12 4 5 8 11 14 14 18 15 16 12 15 15 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 11 12 11 13 14 13 22 19 15 14 15 12 12 6 6 12 19 22 29 25 24 20 22 20 14 20 This level was not instrumented for wind speed at this time 6 9 8 11 16 14 18 14 13 11 13 12 12 7 his level was not instrumented for wind speed at this time 7 This level was not instrumented for wind speed at this time 7 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 11 12 11 13 14 13 22 19 15 14 15 12 12 9 8 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 This level was not instrumented for wind speed at this time 6 9 8 11 10 14 18 14 13 11 13 12 12 7 6 4 5 8 11 14 14 18 15 16 12 15 15 13 10 6 This level was not instrumented for wind speed at this time This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 11 12 11 13 14 13 22 19 15 14 15 12 12 9 8 14 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 17 This level was not instrumented for wind speed at this time 6 9 8 11 14 14 18 15 16 12 15 15 15 10 6 10 This level was not instrumented for wind speed at this time 7 7 6 8 10 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 11 12 11 13 14 13 22 19 15 14 15 12 12 9 8 14 11 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 17 17 This level was not instrumented for wind speed at this time 6 9 8 11 16 14 18 14 13 11 13 12 12 7 6 8 9 4 5 8 11 14 14 18 15 16 12 15 15 11 10 6 10 6 This level was not instrumented for wind speed at this time	This level was not instrumented for wind speed at this time 11 12 11 13 14 13 22 19 15 14 15 12 12 9 8 14 11 13 13 6 6 12 19 22 29 25 24 20 22 20 14 20 15 12 17 17 10 This level was not instrumented for wind speed at this time 6 9 8 11 14 14 18 15 16 12 15 15 13 10 6 10 6 7 This level was not instrumented for wind speed at this time

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							Rela	tive Fr	edneu.	Relative Frequencies* of Wind Directions by Hour at 46.0 m.	of Win	d Dire	ctions	by Hc	our at	46.0 n	-							
												(%)		•										
ž ž	10	02	03	94	03	99	40	80	60	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
z			3.3			3.4			10.4	27.4	37.8	39.9	13.3	26.6	27.5	20.02	13.3	3.3	9.9		9.9	3.3	3.4	
NNE	3.3						3.4			10.4	6.8	10.01	6.6	3.3	3.4	3, 1	3.3		3.3					
ZE									3.4		6.8	3.3				9.9	عد دي _{د ا} د							
ENE										3.4		3,3												
E																								
ESE																								
SE													_			_								
SSE									3.4			3,3		3.3										
S					3,3												-							
SSW		3.3							3,4	3.4														
SW		9.9							3,4						3.4	3.3						3.3		
wsw	3,3	3,3	6.6	3,3	3.3			6.8			3.4		3,3	9.9			9.9		3.3	· ~(***	3.3		3.4	3.3
A	56.4	49.8	49.8	49.8	59.8	61.9	65.4	55.0	20.7		£ 3.8	3.3	16.6	10.0	17.2	26,6	20,0	20,0	16.6	53.1 49.8	. 1	59.8	65.4	73.1
WNW	20.0	16.6	23.3	26.6	13.4	20.9	17.3	10.4	10.4	17.2	3,4	3.3	10.0	10.0	3.4	13,3	10.C	20.0	23,3	13,3	23.3	16.6	3,4	9
MA	10.0	10.0	6.6	10.0	10.0	3.4	6.8	17.2	17.2	20.8	6.8	20.0	33.2	20.0	13.8	16.6	29.9	33.2	29.9	23.3	13.3	10,0	10.4	13.3
MNN	3.3	3.3	3,3	9.9		3.4			17.2	10.4 26.8 13.3	20.8		13.3	16.6	24.2	10.0 16,6		23.3	16,6	9.9			10.4	
CALM	3.3	6.6	9.9	3.3	10.0	6.8	6.8	10.4	10.4	6.8	-		3.3	3.3	6.8					3.3	3.3	9.9	در م	G.
	2				4.1.		1.000															186	MPRESCRA, 8. A 15555	1888

• Note: Due to rounding, percentage totals do not equal 100%.

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							log	201114		*00,00	of TAFE	7			1								l	
							100		Top ho	SPICIO	***	(%)	ece con	Ei Arria	מתו שו		Ė							
ž ä	10	02	03	0.1	0\$	90	07	80	8	10	=	12	13	14	13	16	17	18	161	30	21	22	23	24
z							3.4		10.4	3.5	17.3	10.0	10.0	16.6	10.4	9.9	10.01	9.9	3,3	3.3			3.4	
NNE									3.4	3.5	3.5	16.6		6.6	6.8	6.6	e.	9.6	3,3					
ZE										21,4	17.9	3,3	10.0	9.9	3.4	10.0	3.3	6.6				3.3		
ENE													3,3		10.4	9.9	က်		3,3					
ш										3.5					3.4									
ESE											3.5			3.3										
SE												3.3												
SSE														3.3										
S												3.3	3.3	3.3										
SSW										3.5														
S.W			3.3						3.4		3.5	3,3				დ	Ann also property of the party							
wsw								3.4	3.4				3,3		3.4					3,3	3.3		3,4	
M	10.0	10.0	3.3	6.6	10.0	20.8 17	17.2	13.8	6.8			3.3	10.0	3,3	6.8		10.0	10.0	6. ë	9.9	13.2	10.01	3.4	10.0
WNW	23,3	23.3	26.6	13,3	16.6	10.4	17.2	10.4	6.8	3,5	3.5	9.9	3,3	13,3	3.4	20.0	10.0	а° Э	10.0	10.0	13,3	26.6	31.0	23,3
N.	3.3	3.3	9.9	9.9	10.0	6.3	10.4	17.2	13.8	17.9	17.9	16.6	20, 0	13,3	13.8	23.3	26.6	13.3	20.0	33.2	23.3	10.0	10,4	6.6
N N	3,3			3.3			6.8	6.8	3.4	10.8	3.5	9.9	10.0	9.9	10.4	S. S.		9.9	13.3	9.9		3.3		6.6
CALM	59.8	63.1	59.8	69.7	63.1	61.8	44.7	48.2	48.2	32.1	28.7	26.6	26.6	23.3	27.5	16.6	29.9	46.6	39.9	36.6	46.6	46,6	48.3	53.1

• Note: Due to rounding percentage totals do not equal 100%.

ALBROOK (Forest site) JANUARY 1967

							Rel	itive F	redner	cles*	of Wis	Relative Frequencies* of Wind Directions by Hour at 4.0 m. ($\%$)	ection	s by H	our at	4.0 n								
Ξ/	10	70	93	8	8	8	0)	80	8	10	=	12	13	14	2	16	-12	8.	19	20	21	2	23	24
z	3.3		3.3		3.3		3.4	6.9	6.9	6.9	3.4	10.0	9.9	3.3	3.4	9.9	13.3	10.0	3.3		10.0	9.9	3.4	
NNE				3.3							6.9	9.9			3.4	1		9.9	9.9	3.3				
E E												3,3	9.9	10.0	3.4			3,3	3,3	3,3				
ENE									3.4	6.9				9.9			3.3							
E										9	3.4		10.0	9.9	6,9	9 9							-	
ESE												3.3	3.3		6.9						_			
SE										- m	6.9	9.9	3.3	9.9		9.9								
SSE											3.4				3.4									
S											3.4	10.0	3.3	3.3		3.3		3.3						3.3
SSW				3.3					3.4		10.4	ۍ ن	9.9	9.9	3.4		9.9				3, 3	West of the second		
SW				3.3					3.4		3.4	3,3	3.3	3.3	3.4	3.3	3.3	3.3	3.3			3.3		-
wsw									3.4				3.3	3,3			3.7	3,3						3,3
W	3,5	9.9	5,3	3.3	3.3	3.4	3.4			6.9	3,4	3.3	3,3	3,3	3,4	3.3	ਜ 1	10.01	3.3	10.0	3.3	-+	10.4	10.0
WNW	10.0	3.3	9*9	3.5		6.9			3.4	10.4		3.3	3.3			9.9	3.3			9.9	9.9	9 9	6.9	3.3
MN	13.3	10.0	13.3	20.0	26.6	17.2	13.8	6.9	6.9			3.3			3.4	9.9	3.3		10.0	9.9	3,3	16.6	3,4	10.0
NNN	3.3		9.9			10.4		3.4			3.4			10.0		1					3,3	6	13.8	10.0
MIAC	66.4	79.7	66.4 63.1	63.1	66.4	6.19	79.0	82.4	68.8	58.4	56	43.2	46.6	46.6	58.6	56,6	89.8	59.8	69.7	69.7 6	69.7	63.1	1 61.9 59.	59. R
•																		-	1			1 MPPASS	C 4 YES	43.00

• Note: Due to rounding, percentage totals do not equal 100%.

CHIVA CHIVA (Open site) JANUARY 1967

				-	-	-	-				-			-									-	
							Rel	ative I	reque	ncies*	Relative Frequencies* of Wind Directions by Hour at 46.0 m. ($\%$)	nd Dir (%)	ection	s by H	four at	46.0	Ė							-
ž ž Ž	10	03	03	95	05	ŷ	07	80	60	10	11	12	13	4.	15	16	17	18	19	20	21	22	13	2.4
z	25.8	22.6	25.8	19.4	22.6	19.4	9.7	19.4	38.7	32,2	35.5	29.0	25.8	26.6	38.7	45.2	32.2	29.0	38.7	16.1	16.6	23.3	25.8	16.1
NNE	3.2	3.2				6.4	6.4			22.6	19.4	19.4	16.1	13.3	16.1	9.7	12.9	3.2	3.2	3.2				3.2
NE	ورد سار									12.9	6.4	9.7	12.3		3.2	3.2		3.2						
ENE										3.2														3.2
Ε																					3.3			
ESE	3.2																							
SE											3.2	3.2												
SSE																								
S			-										3.2											6.4
SSW			3.2										a nere a n'i emmen		100000000000000000000000000000000000000	1000								4
SW		3.2	end ordenavi or pre-		3.2								addy, a defermant pp and			7	111111111111111111111111111111111111111							***
wsw				3.2		3,2																	111111111111111111111111111111111111111	1
W						3.2	1	9.7	Annual of States			3.2									3.3	3,3	3.2	100
WNW		6.4	3.2	6.4	9.7	3.2	و. ر	3.2		3.2			3.2	3.3	3.2	3.2	12.9				1	3.3	3.2	3,2
»Z	19.4	12.9	16.1	32.2	38.7	29.0	45.2	25.8	12.9		12.9		9.7	20.0	9.7	12.9	9.7	9.7 22.6	22.6	35.5	26.6 33.2	33.2	25.0	29.0
BZZ	48.4	51.6	48.4	38.7	25.8	35, 5	29.0	41.9	48.4	25.8	22.6	35.5	29.0	36.6	29.0	25.8	32.2	41.9	25.5	45.2	49.8	55.6 38.7	ì	38.7
CALM			3.2				3																	
																						1 80 1 48 5	IMPRESORA & A -5101	1111

• Note: Due to rounding, percentage totals do not equal 100%

CHIVA CHIVA (Open site) JANUARY 1967

							Rel	ative 1	reque	cies*	of Wt.	rid Dir	Relative Frequencies* of Wind Directions by Hour at 26.5 m. $\{\%\}$	Ly H	our at	26.5	'n.							
H Z	10	05	93	8	60	8	60	80	8	01	Ξ	12	13	=	22	18	1-	18	61	30	212	22	23	24
z	36.6	29.9	49, B	43.2	29.9	33.2	23.3	26.6	66.4	35.5	25.8	22.6	25.8	49.8	45.2	43.4	46.6	43.2	53.2	59.8	55.0	4	80	39.9
Z E E	13.3	20.0	9.9	3,3	13.3	6.6	9.9	6.6	13.3	19.4	25.8	32.2	29.0	16.6	22.6	19.4	16,6			6		4	m	-
NE							10.0	3.3	3.3	29.0	25.8	29.0	19.4	16.6				3.3	9	9 9	41			
FNE							and the same of th			-						3 2		3.3						
щ	3.3			3.3						3.2		3.2					_				3.4			
ESE																							2 2	• !
SE	3.3	3.3				3.3					3.2												,	50
SSE																			 					2
S								3.3				3.2								 -				
SSW							3,3													-	 			
SW	3.3			3,3	3.3				3.3									<u> </u>				are Jacobson v in manifest		
wsw												İ					_							
W		3.3		3.3		9*9							-								3.4			
WNW				а . в	3,3			3.3									3.3					4.0	3.3	And the state of t
NW	10.0	3,3	16.6	13,3	9.9	10.0	23.3	3.3	3.3	6 4		3.2	9.7	9.9	6.4	6.4 1	3.3	9.9	3,3	13.3	,		0	10.0
NNW	29.9	36.6	20.0	26.6	39.9	36,6	29.9	49.8	10.0	3.2	13.4	6.4	9.7	10.0	3.2	9.7	3.3	23.3	16.6	16.6 2	24.2	2		13.3
CALM		3.3	9.9		3.3	3.3	3,3	3,3		-											ĺ		9	3
N.																						- Total	SPECIAL R A 41655	

CHIVA CHIVA (Open site) JANUARY 1967

							Rela	Relative Frequencies* of Wind Directions by Hour at ($\%$)	requen	cies*	of Wir	nd Dire	ctions	by He	our at	4.0 m.								
H	ē	°	î	8	89	8	0	80	8	91	=	12	=	2	52	91	17	18	16	20	21	22	23	24
z	6.4	19.4	19.4	12.9	6.4	6.4	3.2	_	29.0	48.4	45.2	29.0	22.6	-	29.0	32.2	45.2	29.0	32.2	16.1	10.0	20.0	16.1	19.4
NE	3.2		6.4	9.7	12.9		9.7	3.2	12.9	3.2	16.1	22.6	12.9	13.3	3.2	12.9	3.2	6.4	3.2	3.2				9.7
Z		3.2	3.2		6.4		9.7	3.2		16.1	12.9	16.1	19.4	3.3	16.1		6.4	and the state of t	+		13.3	2.3		6.4
ENE						16.1															3.3			9.7
ш				3.2																			3.2	3,2
ESE	3.2	3.2			3.2						3.2													
SE	3.2	3.2																					The same of the sa	**
SSE																								
S			3.2					3.2				3.2												
SSW		particular department of the state of the st				3.2			The second second													was y casasamin underly	errord district Spinish	Principle of the Princi
SW		3.2														3.2	and applications of the state o	Approx.	-			3.3	3.2	
wsw		3.2			: 1 m												3.2							
W	3.2	3.2		3.2	3.2	3.2	3.2	6.4		3.2		3.2					3.2			3.2	3.3	9.9	3.2	
WNW	9.7	9.7	3.2	3.2			16.1	6.4	3.2	3.2			6.4		9.7	3.2	3.2	9.7					3.2	9.7
NK	22.6	22.6	32.2	35.5	29.0	32.2	35.5	35.5	25.8	3.2	12.9	9.7	19.4	23.3	9.7	12.9	12.9	19.4	32.2	38.7	20.0	39.9	32.2	9.7
NNN	41.9	19.4	25.8	25.8	29.0	25.0	12.9	25.8	29.0	22.6	9.7	16.1	19.4	23.3	32.2	35.5	22.6	35.5	32.2	38.7 49.8 26.6	49.8		32.2	32.2
CAIM	6.4	9.7	6.4	6.4	6.4	9.7	9.7	3,2															6.4	
		-	-1		1	j	J															HPR	IMPRESORA. & A. 15405	4344

• Note: Due to rounding, percentage totals do not equal 100%.

SUMMARY OF NON HOURLY DATA

JANUARY 1967

	Summary of Ele	ments with .:-hourly F	requencies o	f Observation	on •••	45 weeksom + +
Site	Element, Units and Exposure	Description	Nu of obl.	Minimum Value	Mo a n or Total Value	Maximum Value
	WBGT Index ¹ (at 1.0 meters)	Index value Dry bulb temp. Wat bulb temp. Black bulb temp.	434 434 434 434	63,8 69,2 68,5 69,8	76.6 79.7 75.1 80.3	82,5 91.0 91.0 96.8
(e	Evaporation ³ (in. at 4 levels)	Piche (46.0 m) Piche (26.5 m) Piche (13.5 m) Piche (0.5 m)	31 31 31 31	0.189 0.128 0.055 0.030	15.971* 11.092* 5.147* 3.019*	0.762 0.500 0.250 0.135
Albrook (Forest site)	Precipitation from Raingauge Network ² (in. at 1.0 meters)	Gauge # 1 Gauge # 2 Gauge # 3 Gauge # 4 Gauge # 5 Gauge # 6 Gauge # 7 Gauge # 8	4 5 5 3 4 4 4 3	0.01 0.01 0.01 0.01 0.01 0.01 0.01	0.41* 0.41* 0.53* 0.36* 0.41* 0.37* 0.46* 0.30*	0.33 0.34 0.41 0.32 0.33 0.30 0.35
	Stem Flow ² (in. at 2.0 meters)	Small tree Medium tree Large tree	2 2 1	0.02 0.01 0.14	0.36 * 0.49 * 0.14 *	0.34 0.48 0.14
te)	WBGT index (at 1.0 meters)	Index value Dry bulb temp. Wet bulb temp. Black bulb temp.	434 434 434 428	68.0 68.5 68.0 67.9	79.5 82.8 75.3 92.4	86.9 93.0 93.0 112.8
Chiva Chiva (Open site)	Evaporation ³ (in. at 0.5 meters)	Piche Pan	24 38	0.116 0.054	8.869* 9.366*	0.512 0.531
Chiva	Minimum Grass temp ³ (^O F at grass tip ⁹)	None	30	63.5	67.2	70.0

^{1 -} Hourly observations between 0600 and 1900 hours inclusive 2 - Six hourly observations 3 - Daily observations

*Total Values

DOCUMENT CONTROL PATA - R & D (Socially classification of its a, body of abstract and indesing annotation must be alread when the overall report is classified) 1. ORIGINATING ACTIVITY (Comparis audies) US Army Tropic Test Center Fort Clayton, Canal Zone 3. REPORT SITUE Monthly Microclimatic Summary, January 1967: Environmental Data Base for Regional Studies in the Humid Tropics 4. DECEMPTIVE NOTES (Type of report and inclusive dates) Data Summary, January 1967 5. AUTHORIS (First name, middlo initial, isst name) 5. REPORT DATE March 1968 5. PROJECT NO. 2MO25001A724-01 6. USATECOM No. 9-4-0013-01 6. Work Unit: USATTC #001 10. DISTRIBUTION FTATEMENT Distribution of this document is unlimited. 11. SUPPLEMENTARY NOTES 12. AUSTRACT This report contains detailed microclimatic data for January 1967 from specifi sites in the Panama Canal Zone and vicinity. The data are presented in tabular for summarized for hourly and or daily observations from surface to 46-meter levels. Elements listed are: temperature, pressure, precipitation, wind speed and directic relative humidity, and evaporation.	UNCLASSIFIED	
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